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ABSTRACT

The Armed Services Vocational Aptitude Battery (ASVAB), composed of the common elements of operational classification batteries used by the different services, has been given to high school students since 1968. Results are used by the schools for counseling and by the Armed Services for selecting and classifying potential recruits. The present report documents the development and validation of ASVAB Forms 2 and 3, parallel improved forms which were operational from January 1973 to January 1976. Steps in the development and validation were: (1) preparation of 200 new items for each of the eight cognitive tests of ASVAB-1; (2) field administration to approximately 4,000 Selective Service registrants, stratified to represent the population of young men of military age in order to obtain basic data on the items; (3) preparation of eight 25-item tests based on item analysis of the field data, and generation of two new forms of the noncognitive Coding Speed test; and (4) a second field administration to approximately 3,500 registrants to derive norms and other statistical characteristics of the two new forms. (Author/CTM)

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Technical Paper 289

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DEVELOPMENT OF THE ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB) FORMS 2 AND 3

Leonard C. Seeley, M. A. Fischl, and Jack M. Hicks

PERSONNEL ACCESSION AND UTILIZATION TECHNICAL AREA

U. S. Army

Research Institute for the Behavioral and Social Sciences

February 1978

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The Armed Services Vocational Aptitude Battery, (ASVAB), composed of the common elements of operational classification batteries used by the different services, has been given to high school students since 1968. Results are used by the schools for counseling and by the Armed Services for selecting and classifying potential recruits. The present report documents the development and validation of ASVAB Forms 2 and 3, parallel improved forms which were operational from January 1973 to January 1976.

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FOREWORD

The Army Research Institute for the Behavioral and Social Sciences (ARI) has been a pioneer since World War II in developing and validating instruments for effective selection and classification of potential military enlisted personnel. Research in the field is currently conducted by the Personnel Accession and Utilization Technical Area of ARI.

In 1966 the Assistant Secretary of Defense (Manpower & Reserve Affairs) requested the development of a single aptitude test battery to be used by all Armed Services. All four services --Army, Navy, Air Force, and Marine Corps--participated in developing the requested Armed Services Vocational Aptitude Battery (ASVAB), the Army as lead service with major responsibility.

ARI Research Report 1161 described the development and validation of the first ASVAB, composed of common elements of operational classification batteries used by the different services. ASVAB-1 was used for pre-service testing in high schools from 1968 to 1973. It was replaced in January 1973 by the improved parallel forms ASVAB 2 and 3, which the Army was also the lead service in developing. The present report documents the steps in development and validation of Forms 2 and 3, which were replaced in January 1976 by Forms 5, 6, and 7 developed with the Air Force as lead service.

The original research was performed under RDTE Project 2Q062106A722; current research during FY 1977 on enlisted selection and classification is done under Army Projects 2Q763717A766 and 2Q763731A768.

J. E. UHLANER,
Technical Director

DEVELOPMENT OF THE ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB) FORMS 2 AND 3

BRIEF

Requirement:

To develop new and improved forms of the Armed Services Vocational Aptitude Battery (ASVAB) as replacements for the original ASVAB introduced in 1968 for screening, classification, and counseling in the Department of Defense high school testing program for potential service recruits.

Procedure:

The research steps in the development program were (1) preparation of 200 new items for the experimental test forms of each of the eight cognitive tests of the ASVAB; (2) field administration to approximately 4000 Selective Service registrants, stratified to be representative of the population of young men of military age, in order to obtain basic data on the items; (3) preparation of final forms of eight 25-items tests based on item analysis of the field data, and generation of two new forms of the non-cognitive Coding Speed test; and (4) a second field administration of the tests to approximately 3500 registrants to derive norms and other statistical characteristics of the two new forms of the battery.

Findings:

The resulting ASVAB 2 and 3 were found to be equivalent, and a single conversion table was prepared. The tests had satisfactory reliability, an appropriate range of difficulty levels, and were superior to ASVAB-1 as a tool for high school counseling and the screening and classification purposes of the Armed Services.

Utilization of Findings:

In January 1973 ASVAB Form 2 was implemented in the high school testing program as a replacement for Form 1. Subsequently Form 3 was adopted by the Air Force and the Marine Corps as their operational classification battery.

DEVELOPMENT OF THE ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB) FORMS 2 AND 3

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DEVELOPMENT OF THE ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB) FORMS 2 AND 3

RESEARCH SUMMARY

The purpose of this report is to describe the steps in the development of Forms 2 and 3 of the Armed Services Vocational Aptitude Battery (ASVAB). Forms 1, 2, and 3 of the ASVAB each consisted of nine multiple-choice tests developed for admininstration in the high school test program of the Department of Defense. That program, operated as an adjunct to service and recruiting efforts, offers to test high school students with service-relevant tests and also provides the test results to the schools.

The battery comprises the common portions of the operational classification batteries used by the Services through 1973, and consists of the following tests:

1. Coding Speed. Matching of words and numbers.
2. Word Knowledge. Finding correct synonyms.
3. Arithmetic Reasoning. Logical application of arithmetic operations.
4. Tool Knowledge. Pictorial test of knowledge of hand tools.
5. Space Perception. Pictorial test involving folded and unfolded figures.
6. Mechanical Comprehension. Mechanical principles shown in drawings.
7. Shop Information. Determining correct usage of tools and shop equipment.
8. Automotive Information. Grasp of automotive principles and knowledge.
9. Electronics Information. Principles of electricity and electronics.

In addition, an AFQT score is obtainable from this battery.

The original ASVAB was introduced for use in the high schools in September 1968. Work was then begun on the development of two additional forms of the test as eventual replacements. The research steps in this program consisted of (1) preparation of item pools for experimental test forms, (2) field administration to obtain basic empirical data concerning the items, (3) selection of items to comprise the final test forms, and (4) a second field administration to derive norms and other statistical properties of the two new forms of the battery.

Two hundred new test items of each of eight types of content were administered in AFEES to several national samples of Selective Service registrants stratified to represent the population of young men of military age. The total sample consisted of some 4000 cases, 18% of whom were blacks, and requisite statistics of item difficulty and homogeneity were obtained. Using these statistics, items were assembled into two parallel 25-item forms of each of these eight content types. New forms of the Coding Speed test were generated, and when these were added to the item-analysis based tests, there were two entirely new nine-test batteries.

These batteries were administered to several additional stratified national samples of Selective Service registrants, one form to a sample. A total of 3500 cases, at 13 AFEES, was utilized for this administration. This sample, nationally representative, again intentionally over-sampled black registrants, and consisted primarily of 18- and 19-year-olds, 80% of whom had completed between 10 and 13 years of education. From this administration, percentile and Army Standard Score norms were developed; and test reliability coefficients, intercorrelations, and other characteristics of the new batteries were derived.

BACKGROUND

The original form of the Armed Services Vocational Aptitude Battery was introduced for use in the DOD High School Testing Program at the beginning of the 1968-69 school year. This battery, which comprised the common elements of the operational classification batteries in use by the military services through 1973, consists of nine tests described as follows:

1. Coding Speed. Presents a key showing a series of words each with a 4-digit code number to represent it. Each item presents one of the words and five alternative sets of numbers. The examinee's task is to select the correct code number according to the key.

2. Word Knowledge. For each item the examinee is required to select from a set of four alternatives, the correct synonym for a specified word.

3. Arithmetic Reasoning. For each item the examinee is required to choose, from among four alternatives, the correct answer to an arithmetic problem.

4. Tool Knowledge. Each item presents five drawings of various tools and articles of shop equipment. The examinee indicates which of four alternatives "is used with" or "goes best with" the lead drawing.

5. Space Perception. Each item consists of one three-dimensional figure unfolded and laid out flat, and four folded figures. The examinee is asked to decide which one of the folded figures corresponds to the unfolded figure.

6. Mechanical Comprehension. Each item contains one or more drawings illustrating some mechanical principle. In response to a question about the principle, the examinee decides on the correct answer from a set of four alternatives.

7. Shop Information. These items consist of questions, many of them with drawings, concerning shop tools and practices. The examinee chooses his response from four alternatives.

8. Automotive Information. This test comprises four-choice items measuring knowledge of the automobile, its component parts, and their functioning.

9. Electronics Information. This test consists of four-choice items about principles of electricity and electrical/electronic devices.

Immediately upon introduction of the ASVAB into the high schools, work commenced on the development of two successor forms. The objective was to develop a pair of parallel forms which would be comparable but superior psychometrically to the form then in use in the schools. That early form of the battery, development of which was described by Bayroff and Fuchs,[1] contained some tests in which the mean item difficulties were other than the most desirable. In addition, parallel forms were required, for retest purposes. The research steps to develop the two new forms required (1) preparation of test items, (2) field administration to obtain empirical data concerning the items, (3) selection of the items to comprise final test forms, and (4) a second field administration to derive norms, intercorrelations, and test reliability coefficients.

PROCEDURE

EXPERIMENTAL TEST FORMS

As an initial step, two hundred new four-alternative items were prepared in each of the eight cognitive content areas of the ASVAB. This resulted in 1600 items designed to cover a wide range of difficulty, from extremely easy to extremely difficult. The two hundred items of each of the eight types were arranged into four experimental pools, 50 items to a pool, items in each pool arranged in ascending order of estimated difficulty. These pools were assembled into two series of test booklets, each series containing half of the eight different content areas. They were designated Series W and Series A. The four W Series booklets (W1, W2, W3, and W4) contained Word Knowledge, Space Perception, Mechanical Comprehension and Automotive Information item pools; the A Series (A1, A2, A3, and A4) consisted of Arithmetic Reasoning, Tool Knowledge, Shop Information, and Electronics Information item pools.

[1] Bayroff, A. G., and Fuchs, E. F. The Armed Services Vocational Aptitude Battery. Army Research Institute Research Report 1161, February 1970. (AD 701 907)

FIRST FIELD ADMINISTRATION--ITEM STATISTICS

Field administration took place in two time-blocks, February and August of 1970. At least two AFEES in each of the five recruiting regions were selected (Table 1). Experimental test booklets were administered at these AFEES to samples of Selective Service registrants reporting for pre-induction processing. This step was accomplished through the joint effort of research representatives of the Army, Navy, Air Force, and Marine Corps, the Army acting as lead service. The total number of cases was approximately 4,000, stratified on AFQT to represent the mobilization population of young men of military age. Eighteen percent of this total sample was black.

Each examinee was administered a booklet containing four tests. Testing time for this administration was limited to approximately an hour and three-quarters, minimizing the research intrusion on operational AFEES testing. The experimental booklet was always administered prior to any operational tests.

DEVELOPMENT OF FINAL TEST FORMS

Final forms of the Coding Speed test were constructed by choosing some common nouns to serve as key words, and assigning a different randomly selected four-digit number to each key word. Time limits for this speed test were established through preliminary administration in two of the AFEES shown in Table 1.

Table 1

AFEES SITES FOR DATA COLLECTION FOR ITEM STATISTICS

Booklets W1, W2, A1, A2 February 1970	Booklets W3, W4, A3, A4 August 1970
Chicago, Ill.	Atlanta, Ga.
Cleveland, Ohio	Baltimore, Md.
Columbia, S. C.	Boston, Mass.
Dallas, Tex.	Columbia, S. C.
Detroit, Mich.	Los Angeles, Calif.
Fresno, Calif.	Milwaukee, Wis.
Houston, Tex.	Minneapolis, Minn.
Los Angeles, Calif.	New Orleans, La.
Montgomery, Ala.	Philadelphia, Penna.
New Haven, Conn.	Portland, Ore.
Newark, N. J.	St. Louis, Mo.
Philadelphia, Penna.	San Antonio, Tex.
Salt Lake City, Utah	

Selection of items for the final forms of the eight cognitive tests was performed through statistical analysis of the data gathered in the first field administration. For each of the 1600 items, its difficulty and its correlation with total score over all items of the same content type were calculated. The Difficulty Index (pc) was defined as the proportion of examinees choosing the correct response to each item, corrected for chance success.[2] The proportion of examinees choosing each incorrect alternative was also calculated. The item-test correlation (rit) was computed as the point-biserial correlation (rpb) between each item and total score on the test to which the item belonged, uncorrected for common elements. For this purpose the dichotomous variable was the correct alternative; analogous rit's were also computed for each incorrect alternative.

To implement item selection, all items in a content area were distributed according to difficulty value; then the rit values were examined. In general, an item was selected if it satisfied a place in the target difficulty pattern, had a high rit, had no pc for a wrong choice higher than that of the correct choice, and the rit for the correct choice was substantially highter than that of any wrong choice.

Table 2 shows the distribution of item difficulties for each of the eight cognitive tests, along with the target difficulty pattern toward which the battery was designed.

Table 3 compares the mean item difficulty levels and mean rit's for three forms of the ASVAB. Examination of the pc's shows Forms 2 and 3 to have overcome the primary problems experienced with Form 1; namely (1) the extreme test-to-test variability in difficulty and (2) the observation that Word Knowledge 1 was just too easy. By comparison, no two tests of Forms 2 and 3 are more than three percentage points different in mean item difficulty, and that difficulty value is at a more appropriate level than found in Form 1.

The rit's present a somewhat less decisive picture. Though these values are satisfactorily high for ASVAB 2 and 3, they appear in some cases to be not as high as for ASVAB 1. This difference should not be construed as indicating a deficiency of Forms 2 and 3, however, because ASVAB 2 and 3 coefficients were computed on the basis of the 50-item pools of the item analysis samples. Half the items in these pools were later rejected, partly on the basis of unacceptably low rit's, configuring the final forms for ASVAB 2 and 3. Therefore, the mean rit's for the final versions of ASVAB 2 and 3 would necessarily be higher than those reported in Table 3, and they probably exceed the values shown for ASVAB 1 in the table.

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[2] Using the formula $pc = \frac{np-1}{n-1}$ where p is the uncorrected proportion of correct answers, and n is the number of alternatives per item

Table 2

TEST FREQUENCY DISTRIBUTIONS OF FORM 2 AND FORM 3 ITEMS

Index Difficulty Index (pc)[a]	WK		AR		TK		SP		MC		SI		AI		EI		Target Distribution
	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	
95-99	0	0	0	1	2	2	0	0	0	0	0	1	2	2	0	0	2
90-94	4	4	4	3	2	2	4	4	3	3	3	3	1	1	4	4	2
84-89	3	3	3	3	3	3	2	2	4	4	2	1	3	4	1	1	3
73-83	3	3	3	3	3	3	4	4	3	3	4	5	4	3	4	4	3
60-72	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	3
40-59	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3
20-39	3	3	4	3	3	3	3	3	3	3	3	3	3	3	4	4	3
07-19	5	4	3	4	5	4	4	4	4	4	4	3	4	4	3	3	3
00-06	1	2	2	2	1	2	2	2	2	2	2	3	2	2	2	2	3

Note. WK Word Knowledge
AR Arithmetic Reasoning
TK Tool Knowledge
SP Space Perception
MC Mechanical Comprehension
SI Shop Information
AI Automotive Information
EI Electronics Information

[a]These intervals are the same as those adopted in development of ASVAB-1. For a discussion see Bayroff and Fuchs, 1970, where the standard score equivalents are also shown.

Table 3

MEAN ITEM DIFFICULTY (pc) AND HOMOGENEITY (rit) IN THREE FORMS OF ASVAB

Test	Form 1		Form 2		Form 3	
	pc	rit	pc	rit	pc	rit
Word Knowledge	68.1	.632	54.8	.581	54.5	.582
Arithmetic Reasoning	55.6	.558	55.2	.526	55.2	.526
Tool Knowledge	49.0	.434	55.2	.438	55.2	.446
Space Perception	48.3	.450	55.6	.445	54.9	.410
Mechanical Comprehen.	46.7	.421	54.1	.460	53.9	.447
Shop Information	46.2	.447	53.2	.338	53.4	.402
Automotive Info.	42.4	.517	55.2	.438	55.4	.447
Electronics Info.	49.0	.473	52.6	.423	52.9	.417

SECOND FIELD ADMINISTRATION--STANDARDIZATION

Upon construction of the final forms of ASVAB 2 and 3 (Table 4 shows test order and time allowed for each test) a second field administration was performed to standardize the instruments, i.e., to determine standard scores and percentile equivalents to raw scores. This effort was carried out by administering each form of the battery to approximately 1200 young men in September 1971. These individuals were tested at thirteen AFEES locations (Table 5), representing all five recruiting regions. The majority of the total sample consisted of Selective Service registrants reporting for pre-induction processing; the remainder were applicants for enlistment. Candidates for all military services were represented in the sample; all those included were non-prior service personnel. Virtually all examinees were either 18 or 19 years of age, 80% had completed 10 to 13 years of education, and 15.5% were black.

Table 4
ADMINISTRATION ORDER AND TIME ALLOWED FOR ASVAB FORMS 2 AND 3

	Test[a]	Time Allowed in Minutes[b]
1.	Coding Speed (CS)	7
2.	Word Knowledge (WK)	10
3.	Arithmetic Reasoning (AR)	25
4.	Tool Knowledge (TK)	10
5.	Space Perception (SP)	15
6.	Mechanical Comprehension (MC)	15
7.	Shop Information (SI)	10
8.	Automotive Information (AI)	10
9.	Electronics Information (EI)	10
	Total 9 tests	1 hr. 52 min.

[a]Coding Speed has 100 items. All others, 25 items

[b]Coding Speed is a true speed test. All others are power tests with administrative time limits

Table 5

STANDARDIZATION DATA COLLECTION AFEES SITES, SEPTEMBER 1971

Baltimore, Maryland	Montgomery, Alabama
Cleveland, Ohio	Oakland, California
Detroit, Michigan	Oklahoma City, Oklahoma
Ft. Hamilton, New York	Philadelphia, Pennsylvania
Jacksonville, Florida	Pittsburgh, Pennsylvania
Kansas City, Missouri	St. Louis, Missouri
Los Angeles, California	

The standardization data collection procedure was arranged according to a counterbalanced design. The AFQT was necessary in order to stratify the standardization sample to conform to the mobilization population. Since there were two forms of the ASVAB, four subgroups were defined as follows:

Subgroup	n (approx.)	Test sequence
A	600	ASVAB 2--AFQT -7 or -8
B	600	AFQT-7 or -8--ASVAB 2
C	600	ASVAB 3--AFQT-7 or -8
D	600	AFQT-7 or -8--ASVAB 3

Any other operational tests were administered after both the ASVAB and AFQT had been administered.

At this time, a second group, of approximately 500 examinees, was utilized to determine the equivalence of the counterpart tests of the two ASVAB forms. For this group, ASVAB 2 and 3 were each divided into approximately half-length sections. Section 1 of each form consisted of the first four tests of the battery (CS, WK, AR, and TK), Section 2 of the last five tests (SP, MC, SI, AI, and EI). Each examinee received one section of each ASVAB,--that is, two half-batteries--in counterbalanced sequence resulting in the following breakdown:

Subgroup	n (approx.)	Test Sequence
E	125	ASVAB 2, Sec. 1--ASVAB 3, Sec. 1
F	125	ASVAB 3, Sec. 1--ASVAB 2, Sec. 1
G	125	ASVAB 2, Sec. 2--ASVAB 3, Sec. 2
H	125	ASVAB 3, Sec. 2--ASVAB 2, Sec. 2

This ASVAB testing was done after the operational AFQT had been administered, but before any other testing. No examinee participated in more than one of the above subgroups A through H.

Norms for ASVAB 2 and 3 were calibrated on the basis of the World War II mobilization population, according to the equipercentile method.[3] Subgroups A through D were stratified in terms of scores on AFQT Forms 7C and 8C, then operational. Subsamples 1 and 2 were combined, as were subsamples 3 and 4, yielding two stratified samples from the mobilization population, each of 1250 cases, 125 per decile, one for ASVAB Form 2 and another for Form 3.

The next steps were to derive percentile and standard score equivalents to each test raw score, as well as AFQT percentile equivalents of the sum of raw scores on the WK, AR, TK, and SP tests. Frequency distributions of raw scores[4] were prepared for each ASVAB 2 and 3 test separately, and for each test when ASVAB 2 and 3 were combined. For each test, the conversions for Form 2 were compared with those for Form 3, revealing negligible differences. It was therefore decided that a single conversion table, based on a combination of Forms 2 and 3, could be utilized.

RELIABILITY OF FORMS 2 AND 3

The final step in the development of ASVAB 2 and 3 was estimation of the reliability of the respective tests. For this purpose, the data of subgroups E through H were utilized. Table 6 presents coefficients of equivalence and internal consistency for each test of the battery. These coefficients seem reasonably high for tests of only 25 items. As may be noted, six of the nine tests exhibit equivalence coefficients of the order of .80 or higher, with only the Shop Information test falling below .70. Why the Shop Information test yielded the lowest equivalence coefficients is not apparent, especially since its internal consistency coefficients are of comparable magnitude to the rest of the set.

RELATIONSHIPS WITH RACE AND EDUCATION

Slightly more than 15% of the standardization sample were black, ranging between 13.5% and 17.2% in the four subsamples. Tables 7 and 8 present the intercorrelations of all tests of the battery, as well as their correlations with educational level and race. Generally, the intercorrelations are of intermediate magnitude, the perceptual motor test (Coding Speed) being most independent of the rest of the battery.

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[3] A good discussion of the equipercentile method can be found in Cronbach, L. G. Essentials of Psychological Testing, 3rd edition Harper and Row, 1970, pp. 111-112.

[4] All power test raw scores were computed utilizing the standard correction for chance success with four response alternatives.

The range of correlation coefficients with race is from 0.32, Space Perception in Form 2, to 0.53, Electronics Information in Form 3. In general, correlation is lower for those tests which are nonverbal, such as Space Perception or Tool Knowledge. Also noticeable is the intercorrelation of race with education, which is in the low 0.20's range. When education level is partialled out, these correlations with race reduce from 3 to 7 correlation points to r's of .27 (SP in Form 2) to .48 (EI in Form 3).

Table 6

ASVAB RELIABILITY:
COEFFICIENTS OF EQUIVALENCE AND INTERNAL CONSISTENCY FOR EACH TEST

			Internal Consistency[b]	
Test	Equivalence[a]		Form 2	Form 3
Coding Speed	.83	.86	Not Applicable	
Word Knowledge	.80	.85	.87	.86
Arithmetic Reasoning	.81	.86	.87	.86
Tool Knowledge	.79	.76	.78	.80
Space Perception	.82	.84	.84	.83
Mechanical Comprehension	.77	.73	.83	.83
Shop Information	.67	.65	.81	.82
Automotive Information	.75	.74	.85	.88
Electronics Information	.80	.79	.83	.82

[a]Correlation of Form 2 and Form 3, in two subsamples, Form 2 administered frist in one (N = 250), Form 3 administered first in the other (n = 250).

[b]Utilizing Kuder-Richardson Formula 20, n = 600, each form.

Table 7

ASVAB-2 MEANS, STANDARD DEVIATIONS, AND INTERCORRELATIONS
(Stratified N = 610)

Test	Mean	SD	ASVAB 2									AFQT							
			CS	WK	AR	TK	SP	MC	SI	AI	EI	4T[a]	3T[b]	PCT[c]	VE	AR	SM	PA	RACE
CS raw	41.58	15.33																	
WK raw	13.92	6.19	58																
AR raw	13.97	6.49	56	72															
TK raw	14.34	5.33	27	38	36														
SP raw	14.15	6.32	39	58	62	50													
MC raw	13.85	5.64	45	67	68	58	69												
SI raw	14.31	5.38	35	50	50	69	56	71											
AI raw	14.89	5.61	35	47	49	62	46	67	76										
EI raw	13.89	5.73	44	64	61	58	61	73	69	69									
AFQT 4T raw[a]	50.38	19.66	56	84	85	67	84	82	69	63	76								
AFQT 3T raw[b]	42.04	16.57	58	88	90	47	84	78	60	55	71	97							
AFQT 7-8 PCTL[c]	49.35	28.11	52	74	77	57	77	78	64	59	74	89	88						
VE of AFQT 7-8 raw	16.67	7.22	56	85	71	36	56	66	50	48	64	78	81	80					
AR of AFQT 7-8 raw	14.80	7.42	57	75	85	36	61	67	51	49	63	81	84	85	78				
SM of AFQT 7-8 raw	14.09	5.83	24	37	37	72	48	60	70	70	61	59	47	64	37	40			
PA of AFQT 7-8 raw	13.95	7.38	40	53	58	47	79	65	51	42	56	74	73	83	64	59	49		
RACE (Black-White)	---	---	44	49	46	38	32	49	41	46	48	51	49	49	59	48	41	32	
ED YEARS	12.17	1.85	45	52	48	18	33	38	19	18	36	48	51	47	48	48	15	33	22

Note. Decimal points omitted from r's

[a]AFQT based on 4 ASVAB Tests (WK, AR, TK, SP)

[b]AFQT based on 3 ASVAB Tests (WK, AR, SP)

[c]The operational AFQT

Table 8

ASVAB-3 MEANS, STANDARD DEVIATIONS, AND INTERCORRELATIONS
(Stratified N = 610)

Test	Mean	SD	ASVAB 3									AFQT							
			CS	WK	AR	TK	SP	ME	SI	AI	EI	4T[a]	3T[b]	PCT[c]	VE	AR	SM	PA	RACE
CS raw	41.30	14.33																	
WK raw	13.83	5.86	56																
AR raw	13.76	6.25	59	74															
TK raw	15.20	5.35	28	29	36														
SP raw	13.91	5.81	41	48	57	51													
MC raw	14.26	5.52	46	64	69	50	70												
SI raw	14.18	5.37	40	51	56	66	56	69											
AI raw	14.34	6.26	39	46	52	63	50	63	77										
EI raw	13.62	5.37	42	57	58	53	53	68	69	67									
AFQT 4T raw[a]	56.70	18.36	59	80	86	67	81	80	72	66	70								
AFQT 3T raw[b]	41.50	15.32	61	86	91	47	79	79	64	58	65	97							
AFQT 7-8 PCTL[c]	49.40	27.87	53	70	75	58	70	77	69	64	66	87	84						
VE of AFQT 7-8 raw	16.52	7.17	56	82	73	36	51	66	56	52	63	78	81	79					
AR of AFQT 7-8 raw	15.02	7.32	60	72	81	40	57	70	62	55	60	80	82	86	78				
SM of AFQT 7-8 raw	14.51	5.83	21	29	34	69	46	52	63	65	49	55	42	67	37	41			
PA of AFQT 7-8 raw	13.59	7.18	41	44	54	49	69	62	50	44	47	69	65	83	51	63	50		
RACE (Black-White)	--	--	39	49	46	40	33	45	45	50	53	53	50	48	50	47	43	30	
ED YEARS	12.01	1.74	50	55	58	18	36	45	38	34	43	54	58	52	56	55	21	37	25

Note. Decimal points omitted from r's

[a]AFQT based on 4 ASVAB Tests (WK, AR, TK, SP)

[b]AFQT based on 3 ASVAB Tests (WK, AR, SP)

[c]The operational AFQT

CONCLUSION

The objective in developing ASVAB 2 and 3 was, as stated at the beginning of this paper, to produce two parallel forms which would be comparable but psychometrically superior to the form then in use in the high schools. From the standpoint of coverage of the required range of difficulty, internal consistency, equivalency of both forms, and relationship among the component tests, Forms 2 and 3 of the ASVAB met this objective. They can be regarded as high-quality instruments fully suitable for use in counseling high school students as well as in screening and classifying them, where appropriate, for entry into the Armed Services.

ARI Distribution List

4 OASD (M&RA)
2 HQDA (DAMI-CSZ)
1 HQDA (DAPE-PBR
1 HQDA (DAMA-AR)
1 HQDA (DAPE-HRE-PO)
1 HQDA (SGRD-ID)
1 HQDA (DAMI-DOT-C)
1 HQDA (DAPC-PMZ-A)
1 HQDA (DACH-PPZ-A)
1 HQDA (DAPE-HRE)
1 HQDA (DAPE-MPO-C)
1 HQDA (DAPE-DW)
1 HQDA (DAPE-HRL)
1 HQDA (DAPE-CPS)
1 HQDA (DAFD-MFA)
1 HQDA (DARD-ARS-P)
1 HQDA (DAPC-PAS-A)
1 HQDA (DUSA-OR)
1 HQDA (DAMO-ROR)
1 HQDA (DASG)
1 HQDA (DA10-PI)
1 Chief, Consult Div (DA-OTSG), Adelphi, MD
1 Mil Asst, Hum Res, ODDR&E, OAD (E&LS)
1 HQ USARAL, APO Seattle, ATTN: ARAGP-R
1 HQ First Army, ATTN: AFKA-OI-TI
2 HQ Fifth Army, Ft Sam Houston
1 Dir, Army Stf Studies Ofc, ATTN: OAVCSA (DSP)
1 Ofc Chief of Stf, Studies Ofc
1 DCSPER, ATTN: CPS/OCP
1 The Army Lib, Pentagon, ATTN: RSB Chief
1 The Army Lib, Pentagon, ATTN: ANRAL
1 Ofc, Asst ict of the Army (R&D)
1 Tech Support Ofc, OJCS
1 USASA, Arlington, ATTN: IARD-T
1 USA Rsch Ofc, Durham, ATTN: Life Sciences Dir
2 USARIEM, Natick, ATTN: SGRD-UE-CA
1 USATTC, Ft Clayton, ATTN: STETC-MO-A
1 USAIMA, Ft Bragg, ATTN: ATSU-CTD-OM
1 USAIMA, Ft Bragg, ATTN: Marquat Lib
1 US WAC Ctr & Sch, Ft McClellan, ATTN: Lib
1 US WAC Ctr & Sch, Ft McClellan, ATTN: Tng Dir
1 USA Quartermaster Sch, Ft Lee, ATTN: ATSM-TE
1 Intelligence Material Dev Ofc, EWL, Ft Holabird
1 USA SE Signal Sch, Ft Gordon, ATTN: ATSO-EA
1 USA Chaplain Ctr & Sch, Ft Hamilton, ATTN: ATSC-TE-RD
1 USATSCH, Ft Eustis, ATTN: Educ Advisor
1 USA War College, Carlisle Barracks, ATTN: Lib
2 WRAIR, Neuropsychiatry Div
1 DLI, SDA, Monterey
1 USA Concept Anal Agcy, Bethesda, ATTN: MOCA-WGC
1 USA Concept Anal Agcy, Bethesda, ATTN: MOCA-MR
1 USA Concept Anal Agcy, Bethesda, ATTN: MOCA-JF
1 USA Artic Test Ctr, APO Seattle, ATTN: STEAC-MO-ASL
1 USA Artic Test Ctr, APO Seattle, ATTN: AMSTE-PL-TS
1 USA Armament Cmd, Redstone Arsenal, ATTN: ATSK-TEM
1 USA Armament Cmd, Rock Island, ATTN: AMSAR-TDC
1 FAA-NAFEC, Atlantic City, ATTN: Library
1 FAA-NAFEC, Atlantic City, ATTN: Hum Engr Br
1 FAA Aeronautical Ctr, Oklahoma City, ATTN: AAC-44D
2 USA Fld Arty Sch, Ft Sill, ATTN: Library
1 USA Armor Sch, Ft Knox, ATTN: Library
1 USA Armor Sch, Ft Knox, ATTN: ATSB-DI-E
1 USA Armor Sch, Ft Knox, ATTN: ATSB-DT-TP
1 USA Armor Sch, Ft Knox, ATTN: ATSB-CD-AD
2 HQUSACDEC, Ft Ord, ATTN: Library
1 HQUSACDEC, Ft Ord, ATTN: ATEC-EX-E-Hum Factors
2 USAEEC, Ft Benjamin Harrison, ATTN: Library
1 USAPACDC, Ft Benjamin Harrison, ATTN: ATCP-HR
1 USA Comm-Elect Sch, Ft Monmouth, ATTN: ATSN-EA
1 USAEC, Ft Monmouth, ATTN: AMSEL-CT-HDP
1 USAEC, Ft Monmouth, ATTN: AMSEL-PA-P
1 USAEC, Ft Monmouth, ATTN: AMSEL-SI-CB
1 USAEC, Ft Monmouth, ATTN: C, Facl Dev Br
1 USA Materials Sys Anal Agcy, Aberdeen, ATTN: AMXSY-P
1 Edgewood Arsenal, Aberdeen, ATTN: SAREA-BL-H
1 USA Ord Ctr & Sch, Aberdeen, ATTN: ATSL-TEM-C
2 USA Hum Engr Lab, Aberdeen, ATTN: Library/Dir
1 USA Combat Arms Tng Bd, Ft Benning, ATTN: Ad Supervisor
1 USA Infantry Hum Rsch Unit, Ft Benning, ATTN: Chief
1 USA Infantry Bd, Ft Benning, ATTN: STEBC-TE-T
1 USASMA, Ft Bliss, ATTN: ATSS-LRC
1 USA Air Def Sch, Ft Bliss, ATTN: ATSA-CTD-ME
1 USA Air Def Sch, Ft Bliss, ATTN: Tech Lib
1 USA Air Def Bd, Ft Bliss, ATTN: FILES
1 USA Air Def Bd, Ft Bliss, ATTN: STEBD-PO
1 USA Cmd & General Stf College, Ft Leavenworth, ATTN: Lib
1 USA Cmd & General Stf College, Ft Leavenworth, ATTN: ATSW-SE-L
1 USA Cmd & General Stf College, Ft Leavenworth, ATTN: Ed Advisor
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: DepCdr
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: CCS
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: ATCASA
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: ATCACO-E
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: ATCACC-CI
1 USAECOM, Night Vision Lab, Ft Belvoir, ATTN: AMSEL-NV-SD
3 USA Computer Sys Cmd, Ft Belvoir, ATTN: Tech Library
1 USAMERDC, Ft Belvoir, ATTN: STSFB-DQ
1 USA Eng Sch, Ft Belvoir, ATTN: Library
1 USA Topographic Lab, Ft Belvoir, ATTN: ETL-TD-S
1 USA Topographic Lab, Ft Belvoir, ATTN: STINFO Center
1 USA Topographic Lab, Ft Belvoir, ATTN: ETL-GSL
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: CTD-MS
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATS-CTD-MS
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-TE
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-TEX-GS
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-CTS-OR
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-CTD-DT
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-CTD-CS
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: DAS/SRD
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-TEM
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: Library
1 CDR, HQ Ft Huachuca, ATTN: Tech Ref Div
2 CDR, USA Electronic Prvg Grd, ATTN: STEEP-MT-S
1 CDR, Project MASSTER, ATTN: Tech Info Center
1 Hq MASSTER, USATRADOC, LNO
1 Research Institute, HQ MASSTER, Ft Hood
1 USA Recruiting Cmd, Ft Sheridan, ATTN: USARCPM-P
1 Senior Army Adv., USAFAGOD/TAC, Elgin AF Aux Fld No. 9
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1 Stimson Lib, Academy of Health Sciences, Ft Sam Houston
1 Marine Corps Inst., ATTN: Dean-MCI
1 HQUSMC, Commandant, ATTN: Code MTMT 51
1 HQUSMC, Commandant, ATTN: Code MPI-20
2 USCG Academy, New London, ATTN: Admission
2 USCG Academy, New London, ATTN: Library
1 USCG Training Ctr, NY, ATTN: CO
1 USCG Training Ctr, NY, ATTN: Educ Svc Ofc
1 USCG, Psychol Res Br, DC, ATTN: GP 1/62
1 HQ Mid-Range Br, MC Det, Quantico, ATTN: P&S Div

1 US Marine Corps Liaison Ofc, AMC, Alexandria, ATTN: AMCGS-F
1 USATRADOC, Ft Monroe, ATTN: ATRO-ED
6 USATRADOC, Ft Monroe, ATTN: ATPR-AD
1 USATRADOC, Ft Monroe, ATTN: ATTS-EA
1 USA Forces Cmd, Ft McPherson, ATTN: Library
2 USA Aviation Test Bd, Ft Rucker, ATTN: STEBG-PO
1 USA Agcy for Aviation Safety, Ft Rucker, ATTN: Library
1 USA Agcy for Aviation Safety, Ft Rucker, ATTN: Educ Advisor
1 USA Aviation Sch, Ft Rucker, ATTN: PO Drawer O
1 HQUSA Aviation Sys Cmd, St Louis, ATTN: AMSAV-ZDR
2 USA Aviation Sys Test Act., Edwards AFB, ATTN: SAVTE-T
1 USA Air Def Sch, Ft Bliss, ATTN: ATSA TEM
1 USA Air Mobility Rsch & Dev Lab, Moffett Fld, ATTN: SAVDL-AS
1 USA Aviation Sch, Res Tng Mgt, Ft Rucker, ATTN: ATST-T-RTM
1 USA Aviation Sch, CO, Ft Rucker, ATTN: ATST-D-A
1 HQ, USAMC, Alexandria, ATTN: AMXCD-TL
1 HQ, USAMC, Alexandria, ATTN: CDR
1 US Military Academy, West Point, ATTN: Serials Unit
1 US Military Academy, West Point, ATTN: Ofc of Milt Ldrshp
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1 USA Standardization Gp, UK, FPO NY, ATTN: MASE-GC
1 Ofc of Naval Rsch, Arlington, ATTN: Code 452
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1 Naval Aerospc Med Res Lab, Pensacola, ATTN: Acous Sch Div
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1 Naval Aerospc Med Res Lab, Pensacola, ATTN: Code L5
1 Chief of NavPers, ATTN: Pers-OR
1 NAVAIRSTA, Norfolk, ATTN: Safety Ctr
1 Nav Oceanographic, DC, ATTN: Code 6251, Charts & Tech
1 Center of Naval Anal, ATTN: Doc Ctr
1 NavAirSysCom, ATTN: AIR-5313C
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1 NavHelicopterSubSqua 2, FPO SF 96601
1 AFHRL (FT) William AFB
1 AFHRL (TT) Lowry AFB
1 AFHRL (AS) WPAFB, OH
2 AFHRL (DOJZ) Brooks AFB
1 AFHRL (DOJN) Lackland AFB
1 HQUSAF (INYSD)
1 HQUSAF (DPXXA)
1 AFVTG (RD) Randolph AFB
3 AMRL (HE) WPAFB, OH
2 AF Inst of Tech, WPAFB, OH, ATTN: ENE/SL
1 ATC (XPTD) Randolph AFB
1 USAF AeroMed Lib, Brooks AFB (SUL-4), ATTN: DOC SEC
1 AFOSR (NL), Arlington
1 AF Log Cmd, McClellan AFB, ATTN: ALC/DPCRB
1 Air Force Academy, CO, ATTN: Dept of Bel Scn
5 NavPers & Dev Ctr, San Diego
2 Navy Med Neuropsychiatric Rsch Unit, San Diego
1 Nav Electronic Lab, San Diego, ATTN: Res Lab
1 Nav TrngCen, San Diego, ATTN: Code 9000-Lib
1 NavPostGraSch, Monterey, ATTN: Code 55Aa
1 NavPostGraSch, Monterey, ATTN: Code 2124
1 NavTrngEquipCtr, Orlando, ATTN: Tech Lib
1 US Dept of Labor, DC, ATTN: Manpower Admin
1 US Dept of Justice, DC, ATTN: Drug Enforce Admin
1 Nat Bur of Standards, DC, ATTN: Computer Info Section
1 Nat Clearing House for MH-Info, Rockville
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1 C/Air Staff, Royal Canadian AF, ATTN: Pers Std Anal Br
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1 Medecin Chef, C.E.R.P.A.-Arsenal, Toulon/Naval France
1 Prin Scientific Off, Appl Hum Engr Rsch Div, Ministry of Defense, New Delhi
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